

TRANSMITTAL OF APPEAL BRIEF (Large Entity)

Docket No.
ITL.0907US

In Re Application Of: Robert P. Meagley

MAY 09 2006

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|-------------------------------|------------------------------|----------------------------------|-----------------------|------------------------|--------------------------|
| Application No. 10/616,895 | Filing Date July 10, 2003 | Examiner Richard L. Schilling | Customer No. 21906 | Group Art Unit 1752 | Confirmation No. 1697 |
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Invention: Photodefinable Polymers for Semiconductor Applications

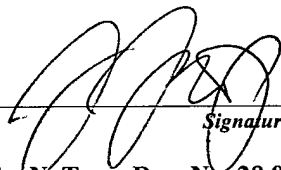
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Dated: May 5, 2006

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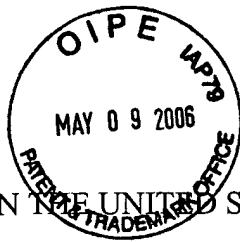
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Nancy Meshkoff

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Applicant:

Robert P. Meagley

Serial No.: 10,616,895

Filed: July 10, 2003

For: Photodefinable Polymers for
Semiconductor Applications

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Art Unit: 1752

Examiner: Richard L. Schilling

Atty Docket: ITL.0907US
(P15299)

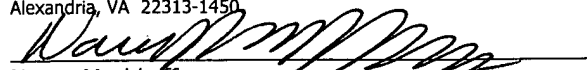
Assignee: Intel Corporation

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APPEAL BRIEF

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REAL PARTY IN INTEREST

The real parties in interest are the assignees Intel Corporation and Sumitomo Bakelite Company, Ltd.

RELATED APPEALS AND INTERFERENCES

None.

STATUS OF CLAIMS

Claim 1 (Rejected).

Claims 2-3 (Canceled).

Claims 4-9 (Rejected).

Claims 10-11 (Canceled).

Claims 12-15 (Rejected).

Claims 16-17 (Canceled).

Claims 18-19 (Rejected).

Claims 20-21 (Canceled).

Claims 22-25 (Rejected).

Claims 26-27 (Canceled).

Claims 28-30 (Rejected).

Claims 1, 4-9, 12-15, 18-19, 22-25, and 28-30 are rejected and are the subject of this Appeal Brief.

STATUS OF AMENDMENTS

All amendments have been entered.

SUMMARY OF CLAIMED SUBJECT MATTER

In the following discussion, the independent claims are read on one of many possible embodiments without limiting the claims:

1. A method comprising:
blending a photodefinable polybenzoxazole precursor with zirconia particles having a particle size of less than 100 nanometers (Specification, page 2, lines 2-23).
9. A photodefinable polymer for semiconductor applications comprising:
a photodefinable polybenzoxazole precursor (Specification, page 2, lines 2-6);
and
zirconia particles having a particle size of less than 100 nanometers (Specification, page 2, lines 7-23).
15. A photodefinable polymer for semiconductor applications comprising:
a photodefinable polybenzoxazole precursor (Specification, page 2, lines 2-6);
and
zirconia particles comprising about 9 to about 20 percent of the system (Specification, page 3, lines 2-7), said particles having a particle size of less than 20 nanometers (Specification, page 2, lines 14-20).
19. A polymer precursor for semiconductor applications comprising:
a photodefinable polybenzoxazole precursor (Specification, page 2, lines 2-6);
and
zirconia particles having a particle size of less than 100 nanometers (Specification, page 2, lines 2-23).

25. An integrated circuit comprising:
a substrate (Specification, page 1, lines 4-9); and
a photodefinable polymer formed on said substrate, said polymer including a photodefinable resin and zirconia particles having a particle size of less than 100 nanometers (Specification, page 2, lines 2-23).

At this point, no issue has been raised that would suggest that the words in the claims have any meaning other than their ordinary meanings. Nothing in this section should be taken as an indication that any claim term has a meaning other than its ordinary meaning.

GROUND OF REJECTION TO BE REVIEWED ON APPEAL

- A. Are claims 1, 4-15, 18-19, 22-25, and 28-30 unpatentable on the grounds of nonstatutory obviousness-type double patenting over claims 20-21 of copending Application No. 10/337,575?**

- B. Are claims 1, 4-9, 12-15, 18-19, 22-25, and 28-30 unpatentable over Sezi in view of Hattori?**

ARGUMENT

A. Are claims 1, 4-15, 18-19, 22-25, and 28-30 unpatentable on the grounds of nonstatutory obviousness-type double patenting over claims 20-21 of copending Application No. 10/337,575?

The examiner has provisionally rejected each of the claims on the ground of nonstatutory obviousness-type double patenting, as being unpatentable over claims 20 and 21 of copending application 10/337,575. The copending application has an earlier filing date than this application. When the application at issue is the later filed application the applicable test is whether “the invention defined in the claim of the application would have been an obvious variation of the invention defined in a claim in the patent.” See M.P.E.P. § 804(II)(B)(1)(a) at page 800-22 (Emphasis added). To be an obvious variation only the claims are considered—the invention defined in a claim of an application has to be an obvious variation of the invention defined in the claim of a patent. M.P.E.P § 804 at page 800-21. The disclosure of the patent may not be used as prior art when determining an obvious variation. *Id.*

But the examiner has done exactly that—based his determination of double patenting on what is found in the specification. For example, in the final Office action the examiner remarks:

The amendments to the claims limiting the filler to zirconia does not overcome the rejection since the claims of 10/337,575 reasonably include the filler as disclosed as suitable in the *specification* wherein zirconia is disclosed.

Paper No. 125, page 2. The claims of the 10/337,575 application do not expressly cover zirconia. Since the claims in the 10/337,575 application do not specifically claim zirconia, and zirconia is not an obvious variant of what is claimed, then the present claims are not obvious over claims 20 and 21 of the ‘575 application.

In sum, a provisional obvious-type double patenting rejection is to prevent an extension of the right to exclude. M.P.E.P. § 804 at page 800-11. Because the use of zirconia as claimed in this application is not an obvious variation of the claims 20 and 21 of the 10/337,575 application the right to exclude would not be extended.

B. Are claims 1, 4-9, 12-15, 18-19, 22-25, and 28-30 unpatentable over Sezi in view of Hattori?

In addition to the provisional obviousness-type double patenting rejection, the examiner rejected each of the claims under 35 U.S.C. §103(a) as being unpatentable over Sezi in view of Hattori.

Sezi does not teach the use of zirconia as a filler. Paper No09032004, page 4. In view of the declaration by one of the applicants, there is no reason to believe that the claims so rejected would have been obvious to one of ordinary skill in the art. See Evidence Appendix.

In the declaration received by the USPTO on November 7, 2005, the inventor explains that he and his coinventors initially used silica as a filler material during the course of the development of the photodefinable polymers that are set forth in this application. Declaration, ¶ 2. Silica showed thixotropy or varying viscosity with shear rate. *Id.* The inventors then tried zirconia. *Id.* at ¶ 3. Unexpectedly, when zirconia was used as a filler material the thixotropy was greatly reduced. *Id.* That zirconia would greatly reduce thixotropy was completely unexpected. *Id.*

The inventor's declaration establishes that the use of zirconia as a filler material greatly reduced thixotropy in the photodefinable polymers that the inventors were developing. The reductions observed by the inventors were unexpected. Thus the use of zirconia, in and of itself, gave an unexpected result. This alone rebuts the examiner's assertion of *prima facie* obviousness. This is, if a compound is unexpectedly superior in one of a spectrum of common properties *prima facie* obviousness may be rebutted. M.P.E.P. § 716.02(a)(II) at page 700-268. No set number of examples of superiority is required. *Id.* at 700-269.

Thixotropy may be undesirable in some photodefinable polymers. The applicants have shown that zirconia has a superior ability to reduce thixotropy over the use of other filler materials such as silica. Therefore, the examiner's maintenance of the 103(a) rejection is believed to be in error.

In the final Office action, the examiner asserts that the declaration is unconvincing due to the lack of detail. It is unclear why any details are needed. The point is not whether specific

details of the declaration render the claimed invention obvious or not, but instead that the use of zirconia, in and of itself, renders the claims non-obvious over prior art (which teaches silica). Thus there is no reason to give additional details because the point is that, generically, silica cannot render obvious the claimed invention to zirconia in these circumstances.

The examiner also asserts that the declaration is not convincing because there is no basis in the specification for the property of thixotropy being important or critical to the invention. But the applicant is not required to place anything in the specification to support unobviousness. M.P.E.P. § 716.02(f). Obviousness is determined by the totality of the record including evidence offered during prosecution. *Id.* The evidence offered in this case demonstrates that thixotropy occurred when silica was used as a filler material and that zirconia greatly reduced thixotrophy. Therefore, it does not matter whether the specification indicates that thixotropy is important or critical.

The examiner is also unconvinced because, in his view, the specification discloses silica and zirconia as equivalents. Again, the M.P.E.P. expressly indicates that there is no requirement that any of the arguments of non-obviousness be placed in the specification. M.P.E.P. § 716.02(f). Since the best mode is disclosed, the fact that advantages to one or the other species is not discussed in the specification is of no importance as the advantages of zirconia are discussed in the declaration.

The examiner's last reason for remaining unconvinced is focused on the specification. But the test is whether the affidavit indicates effectiveness over the entire claimed range. See M.P.E.P. § 716.02(d). Here, the showing in the declaration is broader than the claims and shows that, over the entire range and a broader range, zirconia would unexpectedly be more effective than silica. Thus there is no requirement that a showing wherein zirconia is generically unexpectedly better needs to be supplemented by showing that, in each individual case claimed, zirconia is better. It is better in general and, therefore, it is better in specific.

The specification page 2, lines 17-23 state that, in one embodiment, the particle size of the filler is less than 100 nanometers and that the filler may be zirconia particles which is the same range and material as claimed. An embodiment including zirconia particles with a particle size of less than 100 nanometers exhibits greatly reduced thixotropy. Greatly reduced thixotropy is due to the use of zirconia, not the particle size. This is evidenced by the declaration that states

the inventors were contemplating the use of silica and when zirconia was tried the thixotropy was reduced.

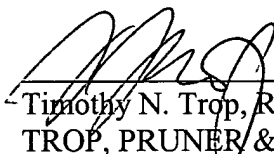
In sum, the declaration submitted by one of the inventors rebuts the examiner's assertions of obviousness. Apparently the examiner is not convinced because, in his view, the declaration and specification are of different scope. The specification is not required to address issues of non-obviousness. But in this case the declaration is offered for just that reason: to show non-obviousness. Thus both the specification and the declaration should be considered for what they offer.

Because the examiner erred in his rejection of the claims the rejection should be reversed.

Applicant respectfully requests that each of the final rejections be reversed and that the claims subject to this Appeal be allowed to issue.

Respectfully submitted,

Date: May 5, 2006



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CLAIMS APPENDIX

The claims on appeal are:

1. A method comprising:
blending a photodefinable polybenzoxazole precursor with zirconia particles having a particle size of less than 100 nanometers.
4. The method of claim 1 including blending the photodefinable precursor with zirconia particles having a particle size less than 20 nanometers.
5. The method of claim 1 including blending the photodefinable precursor with zirconia particles having a particle size of about 13 nanometers.
6. The method of claim 1 including curing the precursor after blending with zirconia particles.
7. The method of claim 1 including blending the precursor with a filler so that zirconia particles constitute from about 9 to about 20 percent by weight.
8. The method of claim 1 including forming a polymer from said blended precursor and zirconia particles.
9. A photodefinable polymer for semiconductor applications comprising:
a photodefinable polybenzoxazole precursor; and
zirconia particles having a particle size of less than 100 nanometers.
12. The polymer of claim 9 wherein said zirconia particles have a particle size of less than 20 nanometers.

13. The polymer of claim 9 wherein said zirconia particles have a particle size of about 13 nanometers.

14. The polymer of claim 9 wherein said zirconia particles comprise from about 9 to about 20 percent by weight.

15. A photodefinable polymer for semiconductor applications comprising:
a photodefinable polybenzoxazole precursor; and
zirconia particles comprising about 9 to about 20 percent of the system, said particles having a particle size of less than 20 nanometers.

18. The polymer of claim 15 wherein said zirconia particles have a particle size of approximately 13 nanometers.

19. A polymer precursor for semiconductor applications comprising:
a photodefinable polybenzoxazole precursor; and
zirconia particles having a particle size of less than 100 nanometers.

22. The precursor of claim 19 wherein said zirconia particles have a particle size of less than 20 nanometers.

23. The precursor of claim 19 wherein said zirconia particles have a particle size of about 13 nanometers.

24. The precursor of claim 19 wherein said zirconia particles comprise about 9 to about 20 percent by weight.

25. An integrated circuit comprising:
a substrate; and
a photodefinable polymer formed on said substrate, said polymer including a photodefinable resin and zirconia particles having a particle size of less than 100 nanometers.

28. The circuit of claim 25 wherein said zirconia particles have a particle size of less than 20 nanometers.

29. The circuit of claim 25 wherein said zirconia particles have a particle size of about 13 nanometers.

30. The circuit of claim 25 wherein said zirconia particles comprise from about 9 to about 20 percent by weight.

EVIDENCE APPENDIX: DECLARATION BY ONE OF THE APPLICANTS

Declaration by one of the applicants under 37 C.F.R. § 1.132 on the following pages.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Applicant: Robert P. Meagley et al.

Serial No.: 10/616,895

Filed: July 10, 2003

For: Photodefinable Polymers for
Semiconductor Applications

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Art Unit: 1752

Examiner: Richard L. Schilling

Docket: ITL.0907US
P15299

Assignee: Intel Corporation
Sumitomo Bakelite Company

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

DECLARATION UNDER 37 C.F.R. § 1.132

Sir:

I, Michael D. Goodner, do state as follows:

1. I am one of the inventors of the above-referenced patent application.
2. In the course of development of the photodefinable polymers set forth in the above-referenced patent application, we initially used silica as the filler material. However, silica showed thixotropy or varying viscosity with shear rate.
3. When the inventors of the present invention tried zirconia, they found that the thixotropy was greatly reduced.
4. The fact that zirconia would greatly reduce the thixotropy was completely unexpected.
5. Therefore, it is believed that the use of zirconia is unobvious in this application over the use of silica since it is unexpected that zirconia would offer greatly reduced thixotropy compared to silica.



6. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Date:

10/25/05

A handwritten signature in cursive script, appearing to read "Michael D. Goodner".

Michael D. Goodner



RELATED PROCEEDINGS APPENDIX

None.